

REMARKS

In view of the above amendments and following remarks, reconsideration of the rejections contained in the Office Action of May 18, 2005 is respectfully requested.

In the Office Action, the Examiner rejected claims 6, 11 and 12 as being unpatentable over Miyashita et al., U.S. Patent 6,167,583 ('583) in view of Miyashita et al., U.S. Patent 5,993,639 ('639). Claims 1, 2, 4, 5, 7-10 and 13-16 were rejected as being unpatentable over these two references and in further view of Hayashi et al., U.S. Patent 6,379,230 (Hayashi). Claim 3 was further rejected over all of the above three references and in further view of Sakurai et al., U.S. Patent 6,082,373 (Sakurai). However, by the above proposed amendments, each of independent claims 1, 6, 7 and 8 has been amended so as to clearly differentiate the present invention from all of the prior art that has been cited by the Examiner.

Each of independent claims 1, 6, 7 and 8 has been amended so as to recite a polishing section or polishing surfaces, a cleaning section and a measuring device for monitoring the pH or ion concentration of electrolyzed water. Further, the cleaning section in each of the independent claims is recited as for cleaning at least a polished surface of the substrate which has been polished. The cleaning section has an electrolyzed water supply device for supplying electrolyzed water to the polished surface of the substrate to form a metal-oxide film on the polished surface of the substrate. Each cleaning section of each of the independent claims also recites a diluted hydrofluoric acid supply device for supplying diluted hydrofluoric acid to the polished surface of the substrate to dissolve the metal-oxide film that is formed on the polished surface of the substrate and remove the metal-oxide film from the polished surface of the substrate.

Support for these limitations is found in the original specification. Reference may be made, in part, to paragraphs 7, 37, 51 and 55-57.

As discussed in paragraph 7, after a layer such as a copper layer has been polished in a CMP process, it has a high activity and is thus liable to be oxidized. If the wafer is left as it is, the oxide film is formed by natural oxidation, which tends to be formed irregularly or non-uniformly, because there is no control of the formation of the film.

Noting Fig. 4, the present invention provides electrolyzed water supply nozzles 25a, 25b supplying anode electrolyzed water to the semiconductor wafer. Further, the present invention provides diluted hydrofluoric acid (DHF) supply nozzles 26a and 26b for supplying DHF to the semiconductor wafer. At least one of each of the nozzles forms an electrolyzed water supply device and a DHF supply device, respectively.

As discussed in section 37, the purpose of supplying the electrolyzed water to the surface of the substrate is to form the metal-oxide film on the surface of the substrate. The purpose of supplying the DHF to the surface of the substrate is to dissolve the metal-oxide film and to remove the film. By supplying electrolyzed water or DHF at desirable places in the polishing apparatus and/or a desirable timing according to its purpose, a substrate having a uniform and good oxide film in quality can be obtained.

Thus, each of the independent claims recites both the electrolyzed water supply device for supplying electrolyzed water to the polished surface of the substrate to form a metal-oxide film on the polished surface of the substrate and a diluted hydrofluoric acid supply device for supplying diluted hydrofluoric acid to the polished surface of the substrate to dissolve the metal-oxide film formed on the polished surface of the substrate and remove the metal-oxide film from the polished surface of the substrate. The prior art cited by the Examiner does not disclose or suggest this combination of aspects of the present invention.

In rejecting claim 4, which has now been canceled in view of the amendments to the independent claims, the Examiner relied upon Miyashita '583. In this patent, there is an upper roll-like brush 3 for supplying a process liquid to an upper surface of a semiconductor wafer 1 and a lower roll-like brush 4 for supplying a process liquid to a lower surface of the semiconductor wafer 1. Each of independent claims 1, 6, 7 and 8, however, recites two different supply devices for supplying a process liquid to a single surface of the substrate. Miyashita '583 fails to disclose two different supply devices for supplying process liquid to a single surface of the semiconductor wafer 1. There is no additional supply device for supplying a process liquid to the upper surface of the semiconductor wafer 1 in addition to the upper roll-like brush 3. There is no additional supply device for supplying a process liquid to the lower surface of the semiconductor wafer 1 in addition to the lower roll-like

brush 4, further. Thus, the reference clearly fails to disclose or suggest two different supply devices for supplying process liquid to the same polished surface of a substrate as required by each of claims 1, 6, 7 and 8.

The additional references cited by the Examiner also fail to disclose or suggest this advantageous combination of processed liquid supply devices for a single polished surface as claimed in each of the independent claims. As such, none of these references suggest the present invention as now proposed.

It is respectfully submitted that entry of the above amendments is appropriate at this time. The final Office Action included a new ground of rejection, which is why the present amendments are presented at this time, and were not earlier presented. The proposed amendments clearly distinguish over the prior art cited by the Examiner and thus serve to place the application into condition for allowance. Accordingly, entry of these amendments at this point in the prosecution is respectfully submitted to be in order, and such entry is requested.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

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